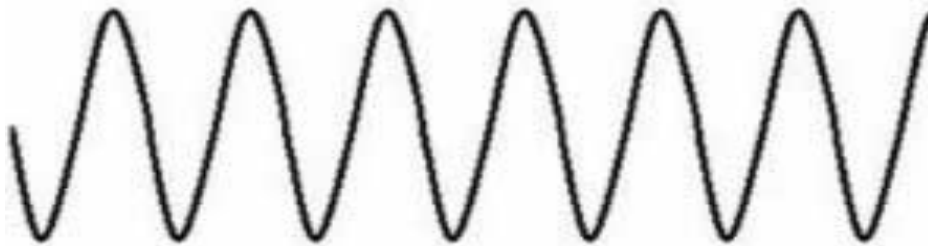
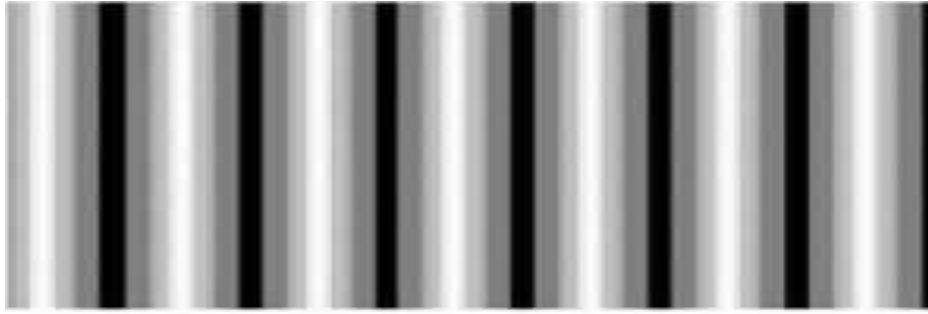


## Wave Properties



1. Which wave above is a transverse wave? A longitudinal wave?
2. On the transverse wave, label a crest and a trough. On the longitudinal wave, label a compression and a rarefaction.
3. What is the wavelength of the transverse wave?
4. What is the wavelength of the longitudinal wave?
5. What is the amplitude of the transverse wave?
6. If the longitudinal wave above completes 6 cycles in 2 seconds, what is its frequency?
7. If the transverse wave above completes 6 cycles in 2 seconds, what is its frequency?
8. If either wave above completes 6 cycles in 2 seconds, what is this wave's period?
9. Given the information above, what is the speed of the longitudinal wave?
10. Given the information above, what is the speed of the transverse wave?

## Frequency, Wavelength and the Speed of Light

1. Given the speed of light in a vacuum of  $3 \times 10^8$  m/s, calculate the frequency for each of the spectral colors in the table.  
(NOTE: The wavelengths in the table are given as single values, when in fact there is a range of wavelengths for each spectral color.)

Light	Wavelength (nm)	Frequency (Hz)
Ultraviolet (UV)	300	
Violet	400	
Blue	475	
Green	510	
Yellow	570	
Orange	590	
Red	650	
Infrared (IR)	800	

2. Given what you know about the different spectral colors of light in the table above, which spectral color is the most dangerous?

Why?

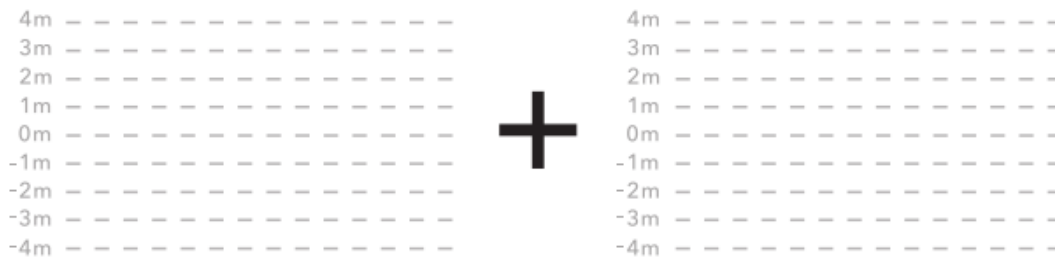
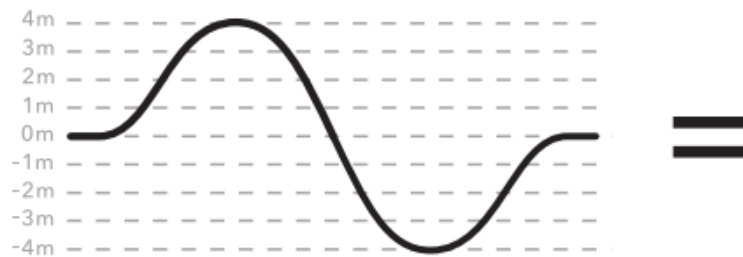
3. Which type of wavelength (larger or smaller) do you think has more energetic photons?
4. Which type of frequency (larger or smaller) do you think has more energetic photons?
5. Why do the answers to 3 and 4 make sense?

## Wave Superposition: Constructive Interference

For each wave set below, draw the superposition of waves in the space between the waves.

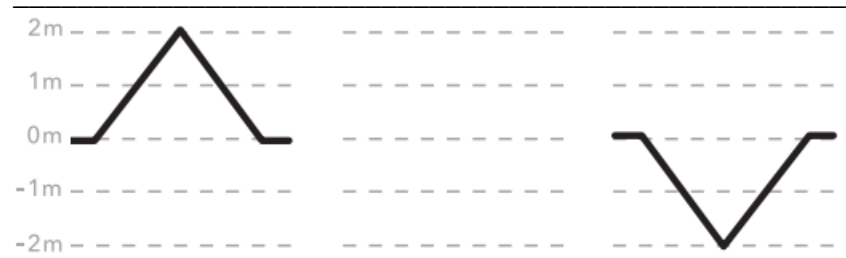


Draw the waves that would result in the pattern below.



## Wave Superposition: Destructive Interference

For each wave set below, draw the superposition of waves in the space between the waves.



Draw the waves that would result in the pattern below.

